

Abstract Submitted
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Probe Induced Dust Cavities in Complex Plasma BRANDON HARRIS, LORIN MATTHEWS, TRUPELL HYDE, CASPER - Baylor University — Spherical, micrometer particles within a Coulomb crystal levitated in the sheath above the powered lower electrode in a GEC reference cell are perturbed using a vertical probe attached to a Zyvex S100 nanomanipulator. The probe is positioned within the cell over a range of locations and used to produce a series of user-controlled potentials that interact with the dust within the complex plasma. As the probe is lowered toward the dust layer, or its potential increased in absolute magnitude, a circular cavity devoid of dust is produced within the crystal. A horizontal force balance is shown to exist between the horizontal confinement, the interparticle repulsion, and the probe. Low density dust regions induced by the probe will be compared to those forming naturally at higher pressures and the 3-D voids observed in complex plasmas on the International Space Station. Finally, dust density waves produced by oscillation of the probe potential will be analyzed and discussed.

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